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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/820,466

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John Rudolph Desjarlais

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EXAMINER

LIN, JERRY

ART UNIT

PAPER NUMBER

1631

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/820,466	Applicant(s) DESJARLAIS ET AL.	
	Examiner JERRY LIN	Art Unit 1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 4-6, 12 and 15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-11, 13 and 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/11/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's election of Group, 1, Species A and Species D (claims 1-3, 7-11, 13 and 14) in the reply filed on April 29, 2008 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Status of the Claims

Claims 1-3, 7-11, 13, and 14 are under examination.

Claims 4-6, 12, and 15 are withdrawn as being drawn to a non-elected group or species.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-3 and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kochendoerfer et al. (US 2004/0115774 A1) in view of Ramnarayan et al. (US 2003/0158672 A1).

The instant claims are drawn to a method of generating a protein attached at a favorable attachment site including the steps of inputting a three dimensional protein structure with amino acid positions, analyzing the structure using a simulation module that identifies positions suitable for attachment of a polymer and identifies a set of possible polymers to generate a matrix of positions and polymers that are energetically favorable, and physically making and screening at least one protein attached at a favorable attachment site. It is noted that the "matrix of positions and polymers" are not used in any calculations or algorithms. Rather, the "matrix of positions and polymers" represent a set of energetically favorable positions and polymers.

Regarding claim 1, Kochendoerfer et al. teaches a method of using three dimensional protein structure information (page 15, paragraph 0137), using a module that identifies amino acid positions suitable for attachment of a polymer (page 14, paragraph 0132-page 15, paragraph 0139); identifying possible polymers (page 14, paragraph 0132-page 15, paragraph 0139); and physically making and screening one protein with a polymer attached at the attachment site (page 16, paragraph 0142-page 0156).

However, Kochendoerfer et al. do not teach creating a set of positions and polymers are energetically favorable.

Regarding claims 1 and 2, Ramnarayan et al. teach using the three dimensional amino acid coordinates of a protein and generating different conformations generate energetically favorable proteins (page 9, paragraph 0122).

Regarding claims 3 and 7-11, Kochendoerfer et al. teach where the polymer is generated by chain buildup (page 26, paragraph 0245-0254); where the protein is a therapeutic protein (page 30, paragraph 0285-0290); where the polymer is the pharmaceutically acceptable PEG (page 25, paragraph 0235; page 30, paragraph 0289); where the polymer has a range between 1000-100000 daltons (page 5, paragraph 0035); and where the polymer is branched (page 26, paragraph 0255).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the methods of Kochendoerfer et al. with Ramnarayan et al. to gain the benefit of being able to determine the thermodynamics of proteins modified with polymers. Kochendoerfer et al. teach a method of synthesizing polymer modified proteins (abstract). However, in designing a modified protein, the stability of the proteins is often a concern. The stability of a protein is often determined by the thermodynamics of a protein. Thus, one of ordinary skill in the art would have been motivated to use methods to determine the thermodynamics of a modified protein. Ramnarayan et al. teach a method of determining the thermodynamics of a protein (page 9, paragraph 0122). Thus, one of ordinary skill in the art would have been motivated to combine the methods of Ramnarayan et al. and Kochendoerfer et al.

Furthermore, one of ordinary skill in the art would have an expectation of success, because Ramnarayan et al.'s method is computational and use information from Kochendoerfer et al.'s method to calculate the thermodynamics of a modified protein.

4. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kochendoerfer et al. (US 2004/0115774 A1) in view of Ramnarayan et al. (US 2003/0158672 A1) as applied to claim 1-3 and 7-11 above, and further in view of Manjula et al. (Bioconjugate (February 2003) Volume 14, pages 464-472).

The instant claims are drawn to a method of generating a protein attached at a favorable attachment site including the steps of inputting a three dimensional protein structure with amino acid positions, analyzing the structure using a simulation module that identifies positions suitable for attachment of a polymer and identifies a set of possible polymers to generate a matrix of positions and polymers that are energetically favorable, and physically making and screening at least one protein attached at a favorable attachment site. In particular the instant claims are drawn to where the polymer is labile and where the simulation module includes molecular dynamics.

Kochendoerfer et al. and Ramnarayan et al. are applied as above.

However, neither Kochendoerfer et al. nor Ramnarayan et al. teach where the polymer is labile or where the simulation module includes molecular dynamics.

Manjula et al. teach where the polymer PEG is labile (page 465, left column), and where the simulation module include molecular dynamics (page 466, right column).

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It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the methods of Kochendoerfer et al., Ramnarayan et al., and Manjula et al. The motivation to combine Kochendoerfer et al. with Ramnarayan et al. is provided above. Manjula et al. teach a method of using computer modeling to determine the best PEG chain using molecular dynamics (page 466, right column). Given that Kochendoerfer et al. is seeking to improve proteins through polymer attachments, one of ordinary skill in the art would have been motivated to use the computer modeling techniques of Manjula et al. with the methods of Kochendoerfer et al. and Ramnarayan et al. to gain the benefit of choosing the best polymer for a protein. Furthermore, one of ordinary skill in the art would have an expectation of success, because Manjula et al.'s method is computational and use information from Kochendoerfer et al.'s and Ramnarayan et al.'s method to calculate the best polymer.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JERRY LIN whose telephone number is (571)272-2561. The examiner can normally be reached on 7:00-5:30pm, M-TH.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie A. Moran can be reached on (571) 272-0720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jerry Lin/
Examiner, Art Unit 1631
7/1/08